THE PENNY MAGAZINE

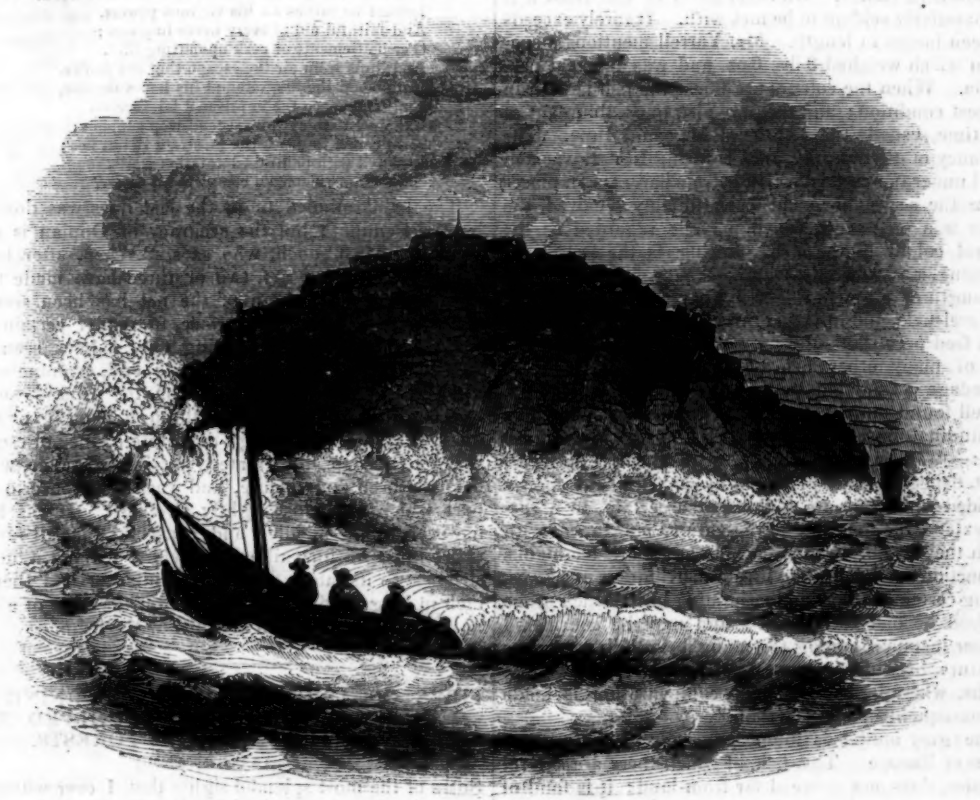
OF THE

Society for the Diffusion of Useful Knowledge.

364.] PUBLISHED EVERY SATURDAY. [DECEMBER 2, 1837.

BRITISH FISHERIES.—No. XVII.

THE MULLET.



[Fishing Boat off St. Alban's Head. Dorsetshire.]

ST. ALDHELM'S, commonly called St. Alban's Head, is a well-known landmark on the Dorsetshire coast. It does not stretch out so far into the sea as the opposite promontory of Portland Bill; but a line drawn from one point to the other, and which would be above twenty miles in extent, would comprise a large expanse of ocean, in which are to be found good roads for shipping, safe harbours, and secure coves for smaller vessels. The cliff, which presents its rugged form sea-ward, rises almost perpendicularly to a height of 441 feet. On this promontory a chapel was dedicated to St. Aldhelm, the first bishop of Sherborne. It was vaulted with stone, and sustained by a single massive pillar. The only means for the admission of light was by the door. It was an oratory, rather than a chapel, in which, according to Hutchins, the historian of Dorsetshire, masses were said, and prayers uttered for the passing mariner, who left some recognition of his gratitude at the next port at which he touched, to be applied to the maintenance of the priest. In the beginning of the present century the building was nearly in ruins.

The coast between St. Alban's Head and Portland Bill is a scene of considerable activity in the fishing-season, though not in so great a degree as that further to the west, where the pilchard abounds, or as that to the eastward, which is nearer to the London markets. There is no grand harvest for the fisherman, as on those parts of the coast to which the herring and pilchard resort; but his pursuits are more uniform, and perhaps not the less profitable. Amongst other descriptions of fish, the mullet is taken to a considerable extent. There are several varieties of this fish, which was held in greater esteem in ancient than it is in modern times; when it was a common proverb that he who took a mullet never ate it, the high price which it bore being an inducement to hurry with it to the best market, where it fetched, it is said, as much as its weight in silver; and there even arose contentions among epicures as to which should become the purchaser. It is stated by Martial that the cost of a mullet, of the weight of about four pounds and a half, was still higher; and the price rose at each successive increase of weight. A sum equivalent to 240*l.* was once given for three of more than ordinary size, which happened to be in the market just before a banquet of unusual magnificence. They were often brought to table alive in glass vases, and a barbarous pleasure was derived from witnessing the changes of colour which they underwent in expiring. This may be taken as one of the characteristics of the most polished

class among a people which stood the foremost in ancient civilization. Apicius invented a mode of suffocating the mullet in a kind of pickle; and Seneca endeavoured to put an end to these practices. The roe of the mullet is used in Italy for the purpose of making a preparation which stimulates the appetite. The part is taken out whole, and covered with salt for about five hours, and is then pressed, but not strongly, between two boards; it is subsequently washed, and afterwards exposed to the sun, when it soon becomes fit for use. It is eaten with oil and lemon juice.

The red mullet is taken along the whole length of our southern shores. On other parts of the coast it is comparatively seldom to be met with. It rarely exceeds fourteen inches in length. Mr. Yarrell mentions a specimen which weighed 3 lbs. 6 oz. and was in great perfection. When the colours are finest the fish is then in the best condition; and they are also most abundant at that time, usually the months of May and June. The brilliancy of their appearance is owing to extravasated blood under the cuticle, which is transparent. In places where the scales have not been forcibly removed, the colour is a pale pink, which may be regarded as the natural colour of the fish. Spring is the season of spawning, and towards October the young are above the length of a man's finger. They are caught by the mackerel-nets, and in larger quantities by the trawl-net. They feed near the bottom, and are provided, as in the case of many other fish of similar habits, with an appendage articulated to the mouth, and which Mr. Yarrell found on investigation to consist of "numerous longitudinal muscular and nervous fibres." Mr. Yarrell adds:—"These appendages are to them, I have no doubt, delicate organs of touch, by which all the species provided with them are enabled to ascertain, to a certain extent, the qualities of the various substances with which they are brought in contact, and are analogous in function to the beak, with its distribution of nerves, among certain wading and swimming birds which probe for food beyond their sight; and may be considered another instance, among the many beautiful provisions of nature, by which, in the case of fishes feeding at great depths, where light is deficient, compensation is made for consequent imperfect vision."

The grey mullet is found generally on the western shores of Europe. This fish, of which there are several varieties, does not proceed far from land; it is fond of shallow water, and also the mouths of rivers, which it frequently enters. This is a striking peculiarity in its habits. In France, the mullet is taken in the Garonne, the Seine, and the Loire, and it has been found in the latter river at a distance of forty leagues from the sea. It is stated, in the great French 'Encyclopédie,' that the mullet spawns in the Loire like the salmon. The mullet is well known in the river Arun, in Sussex, and was found twenty miles from the sea in 1834, which Mr. Yarrell states was higher than it had usually ascended,—a circumstance to be attributed to the heat of the summer. When in fresh water, the mullet is sometimes taken by anglers just before it returns to the salt-water with the ebb-tide. It is, however, extremely cautious in taking a bait. Fuller, in his account of Sussex worthies, mentions, among other things for which that county is celebrated, the six following:—a Chichester lobster, a Selsey cockle, an Arundel mullet, a Pulborough eel, an Amberley trout, and a Rye herring. The mullet is described as possessing more intelligence than fish generally. Not only is it difficult to take them with a line, but they even make their escape when enclosed in a net by throwing themselves over its outer circle. If one succeed, all the rest follow, like a flock of sheep, and the fishermen lose the fruits of their exertion. Mr. Crouch, who has contributed some valuable remarks to Mr. Yarrell's work on 'British Fishes,' describes the susceptibility of constraint and danger in the mullet, from observations made at a salt-water mill-pool of about twenty acres in extent, into which the mullet entered by the floodgate. On the gates being closed, owing to the turn of the tide, "the wall is examined in every part; and when the water is near the summit, efforts are made to throw themselves over, by which they are not uncommonly left on the bank to their own destruction." Oppian, who lived in the beginning of the third century, described the habits of the mullet in the following terms:—

"The mullet, when encircling seines enclose,
The fatal threads and treach'rous bosoms knows.
Instant he rallies all his vig'rous powers,
And faithful aid of every nerve implores;
O'er battlements of cork up-darting flies,
And finds from air the escape that sea denies.
But should the first attempt his hopes deceive,
And fatal space the imprison'd fall receive,
Exhausted strength no second leap supplies;
Self-doom'd to death the prostrate victim lies;
Resign'd with painful expectation waits,
'Till thinner elements complete his fates."

The habit alluded to in the last lines was doubted by Mr. Pennant; but the accuracy of Oppian is confirmed by Mr. Crouch, who says, "When, after being surroundered by a net, two or three have made their escape, and the margin of the net has been secured and elevated above the surface, to render certain the capture of the only remaining one, I have seen the anxious prisoner pass from end to end, examine every mesh and all the folds that lay on the ground, and at last, concluding that to pass through a mesh, or rend it, afforded the only though desperate chance of escape, it has retired to the greatest possible distance, which has not been done before, and rushed at once to that part which was most tightly stretched. It was held, however, by the middle; and, conscious that all further effort must be unavailing, it yielded without a further struggle to its fate." A young mullet of less than an inch in length will throw itself over the edge of a cup, in which the water is an inch below the brim.

FIRES OCCASIONED BY THE BURNING OF THE "CHOPPINGS," OR "CHOPPED FALLOWS," IN THE AMERICAN FORESTS.

[From a Correspondent.]

Some of the most splendid sights that I ever witnessed were the burnings of what the American woodmen call "choppings," or "new fallows." Of course the grandeur and sublimity depend, in a great measure, upon the situation, nature, and extent of these choppings; but in every instance it is a magnificent and imposing spectacle. I have been present at some scores of exhibitions of this nature, and have beheld conflagrations of fallows of all dimensions, from one acre to something exceeding a couple of hundreds. But the magnificence of the scene by no means increases in the ratio of the number of acres, for I have seen a more splendid fire upon a piece of ground of ten acres than what I have witnessed at another time where the chopping was of five times that extent; but this, however mainly depends upon the character of the timber, and the degree of dryness or combustibleness at the time the "burning" takes place.

It will not be out of place to remark that in the forests of America there is, almost universally, a considerable covering of leaves in various degrees of decay, besides vast quantities of dead fibres and rotten branches, even while the trees are alive and standing. Moreover, it frequently happens that there is a portion of underwood ("under-brush," as the Americans term it), previous to the cutting down of the timber. When a part of the forest is doomed to destruction, in the first instance this under-wood is all cut down, including every

sapling or young tree which does not exceed six inches in diameter. After this operation has been performed, the axes are applied to the full-grown trees; so that in due time not a stick is left standing, with the exception of such remnants of old decayed trees as, in the opinion of the axe-men, will become totally consumed in consequence of the general conflagration, for they will continue to burn for some days, and thus the labour of cutting them down is avoided.

When a good-sized tree has been prostrated, the next thing to be done is the lopping-off of every limb and branch that belongs to it; which falling closer to the surface of the ground, a more dense and compact mass of combustibles is consequently formed for the fire to act upon. Each tree also is cut into several pieces of ten or fifteen feet in length, varying according to the thickness or diameter, by which means a great quantity of chips or cuttings is mixed with the dead leaves and branches. Sometimes the woods are cut down when in full foliage, which tends to make the fallow somewhat more inflammable; but this is not generally the case, neither does it make a material difference, for should the leaves have fallen from the trees they will be found dry and crisp upon the earth's surface.

These conflagrations—"burnings" as they are significantly called—usually take place during the driest part of summer, although it is by no means uncommon to find the inhabitants of the new settlements burning their fallows in the spring of the year. There is, however, more danger to be apprehended from burning them at this season; for should the weather, and consequently the woods, be peculiarly dry, when once the fire has communicated with the covering of crisp leaves, it is found all but impossible to extinguish it, or to obstruct its progress; so that, without the exercise of a great degree of caution, much damage is frequently done to large ranges of the forest, as well as to the improved lands. As timber is absolutely valueless in many situations in the woods, it may seem somewhat paradoxical to assert that it can be damaged, or made worse, and may, therefore, require a short explanation. Should the dead leaves be very dry and abundant, when the fire gets into the woods the general conflagration, as it creeps insidiously along, will be of sufficient power to give the growing timber such a scorching as to destroy the principle of vitality in the chief part of it, and, in some cases, the entire forest. The timber which has been killed in this manner becomes so hard in a very few years, that a chopper would rather cut down two living trees than one of these dead ones; so that in this way damage has been done to the forests by the trees being killed by the fire. The meadows and pastures, too, are in danger from the spring burnings, since the vegetation which covers the fields when winter sets in, becomes, by the early part of spring, as dead and dry and combustible as any stubble; so that, when once the fire gets into the enclosures, the fences, which are mostly composed of wooden rails, are sure of being destroyed unless they are precipitately removed, or a great deal of pains otherwise taken to prevent their destruction; and it is no uncommon occurrence for the farm buildings to share a similar fate.

When a settler is about to burn his fallow, it is his duty to give warning of the circumstance to all his neighbours, in order that they may attend on the occasion and assist (if they feel disposed to do so) in keeping the fire under proper subjection, or rather within prescribed limits. Should the season be summer, there is no danger of the fire extending to the meadows and pastures, the verdure preventing that; but much caution is necessary in order to prevent its "running" in the woods, and communicating with the adjoining fences. Therefore, before the time arrives for setting fire to the fallow, a number of persons undertake the raking away of the leaves and dry twigs to the breadth of two or three feet in a continuous path around the whole of it. This operation is performed with hoes, and so deep and effectually that it has the appearance of a shallow ditch. It is necessary that it should be situated at the distance of several rods from the extreme verge of the chopping, because pieces of burning timber are often thrown to a considerable distance by the fury of the conflagration. Besides, the persons placed in the woods, and armed with the branches of some full-leaved tree, wherewith "to fight the fire," would not be able to approach closer when the burning is at its height. The hotter the day is so much the better for the fallow-burner, because the fire rages with greater fury when the sun shines hot; and on his getting a good or bad burn the chance of a future crop of grain mainly depends. Moreover, should the burn be a good one, it saves the party engaged in clearing the land a great deal of labour; for in this case all the smaller branches, with the dead and dry timber, will be totally consumed, and not have to be picked up when the larger and sounder timber is afterwards burned off. It is customary to set fire to the fallow on all sides, but I am not sure that this is the best plan; for were it applied only at one corner, and that corner in an opposite direction to the current of wind, I know very well, from frequent observation, that the conflagration would progress rapidly to windward, there being such a profusion of fuel to entice, excite, and feed the flame. If there should be but a gentle breeze at the time of the burning (which commonly is the case), after once the fire gets to raging, there is apparently in its vicinity a perfectly dead calm. While the ocean of flame rages furiously over a chopping of thirty or forty acres, the rush and the roar of the flame are tremendous—almost deafening, and truly terrific! When you are as close to the fire as the heat will admit of your standing, you behold little more than a vast convolving pyramid of dense vapour and smoke. At its base it is pitchy black; in the second region the rolling masses assume a semi-opaque appearance; and higher still the summit of the column is rolled away horizontally in the form of fleecy summer clouds. There is no danger of the dense smoke being driven in upon you, no matter on which side of the burning mass you may have stationed yourself; for the rushing in of the atmospheric air from all sides is such, that the volume of vapour is forced up almost perpendicularly.

To witness a burning of this description from a moderate elevation, at the distance of a few hundred paces, is by far the most interesting sight; for from such a situation you will occasionally have an opportunity of observing the vast height to which the serpent-tongued flame darts upward in its fury. The surrounding forest-trees are generally 100 feet high, and in some cases considerably more; yet it is no unusual thing to see occasional bursts of flame flickering above the tops of the tallest of them. At a moderate distance the roar is not so deafening, yet the general moving and progressing of the fire is distinctly visible These burnings take place about the hour of the day that the sun is on the meridian, so that the shadow of the pillar of smoke is on the north side of the fire; and within the verge of that shadow there is almost a total darkness. Such is the magnificent picture presented by the burning of a large fallow in the forests of America! On a still summer day I have distinctly heard the roar of one of these conflagrations at the distance of four or five miles.

Nothing escapes the fury of one of these burnings. Foxes and various other wild animals often have their haunts in the new fallows, since they afford an impregnable cover; and here, also, some of the feathered

tribes rear their young. And should they be found within the limits when the circle of flame is kindled, vain will be every attempt to pass the dreadful barrier.

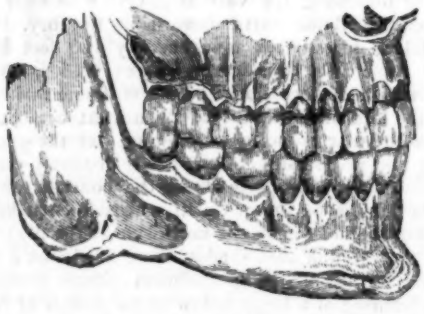
The efforts of those who assemble at these burnings are not at all times, in spite of their best endeavours, successful in preventing the spreading of the fiery deluge; and, should the season be extremely dry, when the fire has once got into the woods and clearings, there is no calculating the damage which the district may sustain, or the extent of country it may overrun; for, although the population of all the surrounding settlements should muster to "fight the fire," they cannot conquer the all-powerful element,—though they may be able to preserve many of the buildings and fences which otherwise would have been destroyed. Until there is a change of weather,—that is, until there occurs a copious fall of rain,—the fire continues to sweep over the adjoining country. On some occasions whole settlements are destroyed, the inhabitants scarcely having time to carry off their few household goods, so rapidly does the destroyer sweep down upon them. All the "improvements" which several years of privation and toil have enabled the settlers to collect around them, are, in a few short hours, utterly and totally laid waste! Nor are its ravages invariably confined to the destruction of property; for, owing to negligence, or to too much foolhardiness, lives are sometimes sacrificed in these general burnings. About twelve years ago, a fire of this description overran a large section of country in the interior of one of our North American colonies (New Brunswick), when it raged uncontrolled during several week,—laying waste the farms and habitations of many hundreds of the inhabitants; and, what rendered the matter still more melancholy and appalling, a considerable number of human beings lost their lives during the conflagration.

ON THE STRUCTURE OF THE TEETH.

(From the 'Philosophy of Health,' by Dr. Southwood Smith.)

EACH jaw is provided with sixteen teeth (fig. CLV.), arranged with perfect uniformity, eight on each side of each jaw (fig. CLV.); those of the one side exactly corresponding with those of the other (fig. CLV.). The teeth, from the differences they present in their size, form, mode of connection with the jaw, and use, are divided into four classes, namely, on each side of each jaw, two incisors (figs. CLVI. and CLVII. 1, 2); one cuspid (figs. CLVI. and CLVII. 3); two bicuspid (figs. CLVI. and CLVII. 4, 5); and three molar (figs. CLVI. and CLVII. 6, 7, 8).

Fig. CLV.



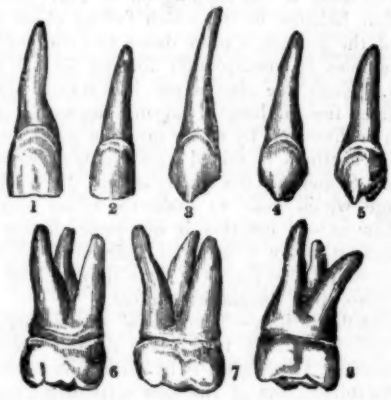
[A latera. view of the whole series of the teeth, *in situ*, showing the relative situation of those of the upper with those of the lower jaw. This figure and the following figures to 159 are copied from Mr. T. Bell's scientific and instructive work on the Anatomy, Physiology, and Diseases of the Teeth.]

The incisor, or cutting teeth, are situated in the front of the jaw; that directly in the centre is called the central; and the next to it the lateral incisor (fig. CLV.). Their office, as their name imports, is to cut the food, which they do, on the principle of shears or scissors.

Standing next to the lateral incisor is the cuspid, canine, or eye-tooth (figs. CLV., CLVI., and CLVII.). It is the longest of all the teeth. Its office is to tear such parts of the food as are too hard to be readily divided by the incisors.

Next the cuspid are the bicuspid, two on each side (figs. CLV., CLVII.), so named from their being provided

Fig. CLVI.



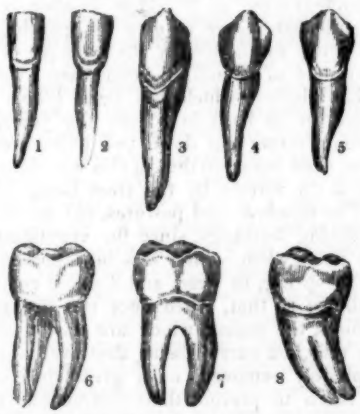
[Front or external view of the upper teeth. 1. The central incisor. 2. The lateral incisor. 3. The cuspid. 4. The first bicuspid. 5. The second bicuspid. 6. The first molar. 7. The second molar. 8. The third molar, or dens sapientiæ.]

with two distinct prominences or points. Their office is to tear tough substances preparatory to their trituration by the next set.

The molares, or the grinders, three on each side (figs CLVI. and CLVII.), provided with four or five prominences on the grinding surface, with corresponding depressions, which are so arranged that the elevations of those of the upper are adapted to the concavities of those of the lower jaw, and the contrary.

From the incisor to the molar teeth there is a regular

Fig. CLVII.



[Front view of the lower teeth. 1. The central incisor. 2. The lateral incisor. 3. The cuspid. 4. The first bicuspid. 5. The second bicuspid. 6. The first molar. 7. The second molar. 8. The third molar, or dens sapientiæ.]

gradation in size, form, and use, the cuspid holding a middle place between the incisor and the bicuspid, and the bicuspid being in every respect intermediate between the cuspid and the molar. Thus the incisor are adapted only for cutting, the cuspid for tearing, the bicuspid partly for tearing and partly for grinding, and the molar solely for grinding. The incisor has only a single root, which is nearly round, and quite simple (fig. CLVII. 1, 2); the cuspid has only a single root,

but this is flattened and partially grooved (fig. CLVII. 3); even the bicuspid has only a single root, but this is commonly divided at its extremity, and is always so much grooved as to have the appearance of two fangs partially united, the body having two points instead of one, thus approaching it to the form of the molar (fig. CLVII. 4, 5); and these last have always two, sometimes three, occasionally four roots, and their body is greatly increased in size, and has a complete grinding surface (fig. CLVII. 6, 7, 8).

In some animals, whose food and habits require the utmost extension of the office of a particular class of teeth, a corresponding development of that class takes place. Thus in the carnivora, as is strikingly seen in the tiger and the polar bear, the cuspid or canine teeth are prodigiously elongated and strengthened, in order to enable them to seize their food, and to tear it in pieces. On the other hand, in the rodentia, or gnawing animals, as in the beaver, the incisors are exceedingly elongated; while in the graminivora, and especially in the ruminantia, the molar teeth are by far the most developed. In each case the other kinds of teeth are of little comparative importance; sometimes they are even altogether wanting. Thus the shark has only one kind of tooth, the incisor; but of these there are several rows, and all of them the creature has the power of erecting at will.

So intimately are these organs connected with the kind of food by which life is sustained, and the kind of food with the general habits of the animal, that an anatomist can tell the structure of the digestive organs, the kind of nervous system, the physical and even the mental endowments; that is, the exact point in the scale of organization to which the animal belongs, merely by the inspection of the teeth.

In man, the several classes of the teeth are so similarly developed, so perfectly equalized, and so identically constructed, that they may be considered as the true type from which all the other forms are deviations.

For the accomplishment of their office the teeth must be endowed with prodigious strength: for the fulfilment of purposes immediately connected with the apparatus of digestion, it is necessary that they should be placed in the neighbourhood of exceedingly soft, delicate, irritable, and sentient organs. That they may possess the requisite degree of strength, they are constructed chiefly of bone, the hardest organized substance. Bone, though not as sensible as some other parts of the body, is nevertheless sentient. The employment of a sensitive body in the office of breaking down the hard substances used as food would be to change the act of eating from a pleasurable into a painful operation. It has been shown (vol. i. p. 84) that provision is made for supplying to the animal a never-failing source of enjoyment in the annexation of pleasurable sensations with the act of eating, and that, taking the whole of life into account, the sum of enjoyment secured by this provision is incalculable. But all this enjoyment might have been lost, might even have been changed into positive pain, nay, must have been changed into pain, but for adjustments numerous, minute, delicate, and at first view incompatible.

Had a highly-organized and sensitive body been made the instrument of cutting, tearing, and breaking down the food, every tooth, every time it comes in contact with the food, would produce the exquisite pain now occasionally experienced when a tooth is inflamed. Yet a body wholly inorganic, and therefore insensible, could not perform the office of the instrument; first, because a dead body cannot be placed in contact with living parts without producing irritation, disease, and consequently pain; and, secondly, because such a body being incapable of any process of nutrition, must speedily be worn away by friction, and there could be no possibility of repairing or of replacing it. The instrument in question, then, must possess hardness, durability, and, to a certain extent, insensibility; yet it must be capable of forming an intimate union with sentient and vital organs, must be capable of becoming a constituent part of the living system.

To communicate to it the requisite degree of hardness, the hard substance forming its basis is rendered so much harder than common bone, that some physiologists have even doubted whether it be bone, whether it really possess a true organic structure. That there is no ground for such doubt the evidence is complete. For,

1. The tooth, like bone in general, is composed partly of an earthy and partly of an animal substance; the earthy part being completely removable by maceration in an acid, and the animal portion by incineration, the tooth under each process retaining exactly its original form.

2. The root of the tooth is covered externally by periosteum; its internal cavity is lined by a vascular and nervous membrane, and both structures are intimately connected with the substance of the tooth. If these membranes really distribute their blood-vessels and nerves to the substance of the tooth, which there is no reason to doubt, the analogy is identical between the structure of the teeth and that of bone.

3. Though the blood-vessels of the teeth are so minute that they do not, under ordinary circumstances, admit the red particles of the blood, and though no colouring matter hitherto employed in artificial injections has been able, on account of its grossness, to penetrate the dental vessels, yet disease sometimes accomplishes what art is incapable of effecting. In jaundice the bony substance of the teeth is occasionally tinged with a bright yellow colour; and in persons who have perished by a violent death, in whom the circulation has been suddenly arrested, it is of a deep red colour. Moreover, when the dentist files a tooth, no pain is produced until the file reaches the bony substance; but the instant it begins to act upon this part of the tooth, the sensation becomes sufficiently acute.

These facts demonstrate that the bony matter of the tooth, though modified to fit the instrument for its office, is still a true and proper organized substance.

Each tooth is divided into body, neck, and root (fig. CLVIII. 1, 2, 3). The body is that part of the

Fig. CLVIII.

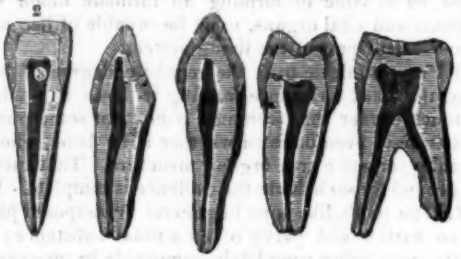
[Views of different kinds of teeth, showing their anatomical division into, 1. The body or crown. 2. The fang or root. 3. The neck.]

tooth which is above the gum, the root that part which is below the gum, and the neck that part where the body and the root unite (fig. CLVIII). The body, the essential part, is the tooth properly so called, the part which performs the whole work for which the instrument is constructed, to the production and support of which all the other parts are subservient.

When a vertical section is made in the tooth, it is found to contain a cavity of considerable size (fig. CLIX. 3), termed the dental cavity, which, large in the body of the tooth, gradually diminishes through the whole length of the root (fig. CLIX. 3). The dental cavity is lined throughout with a thin, delicate, and vascular membrane, continued from that which lines

the jaw. It contains a pulpy substance. This pulp, highly vascular and exquisitely sensible, is composed

Fig. CLIX.—*Sections of Teeth, exhibiting their Structure.*



[1. The bony substance. 2. The enamel. 3. The internal cavity. 4. The foramen, or hole at the extremity of the root.]

almost entirely of blood-vessels and nerves, and is the source whence the bony part of the tooth derives its vitality, sensibility, and nutriment. The blood-vessels and nerves that compose the pulp enter the dental cavity through a minute hole at the extremity of the root (fig. CLIX. 4). The membrane which lines the dental cavity is likewise continued over the external surface of the root, so as to afford it a complete envelope.

[To be concluded in our next.]

National Benefactors.—The names of those who have enriched our gardens with useful and valuable plants are deserving of record and remembrance. Sir W. Raleigh introduced the potato; Sir Anthony Ashley first planted cabbages in this country—a cabbage appears at his feet on his monument; Sir Richard Weston brought over clover-grass from Flanders in 1645; figs were planted in Henry VIII.'s reign, at Lambeth, by Cardinal Pope—it is said the identical trees are still remaining. Spilman, who erected the first paper-mill at Dartford, in 1590, brought over the two first lime-trees, which he planted, and are still growing. Thomas Lord Cromwell enriched the gardens of England with three different kinds of plums. It was Evelyn, whose patriotism was not exceeded by his learning, who largely propagated the noble oak in this country; so much so, that the trees he planted have supplied the navy of Great Britain with its chief proportion of that timber.

Charcoal as a Material for Draining.—Brushwood, broom, gorse, heath, and thinnings of young plantations, after they have been charred, may be employed in filling drains, being lighter, more porous, and hardly susceptible of decay. All known facts and analogies are strongly in favour of this suggestion. The charring may be performed in the usual way by the side of the drains, the brushwood, &c., being made up into faggots of a suitable size previous to charring; and each faggot, necessary, may be secured by a single band of iron-wire near each end to prevent it from falling to pieces; in removing from the hearth to the drain, a light cradle of wicker-work, of the length of a faggot, would probably be found the most convenient machine for its conveyance. It is, however, not at all unlikely that there would be no real necessity to preserve the faggots entire; for it is evident that a heap of sprays of charcoal, broken into pieces two or three inches long, and without any regularity in their arrangement, would form a more *porous material* than an equal bulk of stones. A drain so filled would never be choked, except by particles of earth carried in by the water that flowed through it; for, as the material would always remain, the superincumbent earth would not fall down, as it now usually does, to choke the passage when the bushes which supported it have decayed. Neither is it likely that moles would willingly cross a drain filled with charcoal; and if so, another very usual cause of the destruction of drains would be avoided. In many districts where peat is abundant, this substance, when charred, would probably be found a most valuable material, both for filling drains and for building hollow ones. The brick-like form into which peat is usually cut, and the hardness and *porosity* of the same when charred in a close oven, would constitute a light and excellent material, much cheaper, and probably better than either bricks or tiles.

Curious Fact connected with the Natural History of the Salmon.—A very singular and inexplicable instinct has been ascribed to the salmon, but which has been doubted and disputed by many, even of those who have turned their attention to the subject. The fact to which we allude is, the propensity of salmon to return to the identical rivers wherein they were spawned. This has now been established beyond the possibility of doubt. In the report of our townsman, Mr. Robert Buist, superintendent of the river Tay, under the act for the protection of the breed of salmon, given in to the meeting of heritors in October last, he noticed a curious experiment which had been made last breeding season in certain small fishing rivers in Sutherlandshire. These streams disembogue into Loch Shin, and no salmon were ever known to have existed in their waters before; but as they seemed to be well adapted for breeding this species of fish, the Duke of Sutherland, the proprietor of these rivers, resolved to have them *planted* with salmon. Accordingly, several pairs were carried from other rivers to which they were indigenous, and placed in these during the breeding-season, and there they deposited their spawn. The result was awaited with considerable interest, as calculated to set at rest the disputed question. It appears by a letter Mr. Buist has just received from his correspondent there, that the experiment has been successful. The subject is no doubt of great interest to those concerned with the fisheries, and those who are curious in this department of natural history. The letter states—"Our last year's *planting* of salmon has returned to the same rivers this year. In the commencement of close-time we carried salmon to one of the rivers where we put them last year, and left two of these rivers without putting any into them, to ascertain whether the salmon in reality did or did not return to the rivers where they were spawned; and, at the usual time of spawning, we found a few pairs in each of these rivers, where never a salmon was seen before the fish were put into them last year, so that we can have no doubt of every river having its own breed of salmon, and that they will return to their own rivers, unless interrupted on their passage, or encouraged into other rivers by an unusual quantity of water. I would never believe in this doctrine until I had the experience of it from the different sizes we have in the many rivers in the north. I have studied all this with great care, and I may say now, I am a complete disciple to these habits of the salmon."—*Perth Constitutional.* [In the account of the natural history of the salmon, in the 'Penny Magazine, No. 324, the habit referred to above was not noticed, as it had not been satisfactorily proved, though often believed to exist. The experiment in Loch Shin establishes beyond doubt what may be considered as a striking example of local attachment. The means by which the above results were obtained are detailed in a communication by James Loch, Esq., M.P., to 'Loudon's Magazine of Natural History,' for April, 1837.]

MUMMING.

THIS was an ancient Christmas pastime, consisting of a species of masquerading: the name is derived from the Danish word *mumme*, and the practice is supposed to have arisen from the sigillaria, or festival days added to the ancient Saturnalia. Stowe gives us an account of a mumming made by the citizens of London for Prince Richard, son of the Black Prince, in 1377:—"On the Sunday before Candlemas, a 130 citizens disguised and well-horsed, rode to Kennington, near Lambeth (where the PRINCE was with his mother), with trumpets, sacbuts, shalms*, and other instruments; forty-eight as esquires, two and two, in red coats and gowns of sandal†; forty-eight as knights, one as an emperor, another as pope; twenty-four as cardinals, and eight or ten with black visors as legates of foreign princes: they entered the hall and played at dice with the Prince, who they took care should win, and after that they danced and feasted." In the second year of King Henry IV.'s reign, when he kept his Christmas at Eltham, twelve aldermen of London, and their sons, rode a mumming, and had great thanks; but it seems that a later mumming, in the same reign, in the royal

* Species of Hautboy. † A kind of silk.

palace, was intended as a mode of assassinating the king. Mumming, however, was not confined to royal palaces, and was sometimes productive of mischief; for, by an Act of Parliament in the third year of Henry VIII., it was enacted that mummers shall be imprisoned three months, and fined at the justices' discretion; and persons selling or keeping visors shall forfeit 20*s.* for every visor, and be imprisoned at the discretion of the justices. The masques also appear to resemble the mummings, as Sir Walter Scott, in his notes to the 6th Canto of 'Marmion,' gives the characters of a masque, which include those of Christmas and Mince Pye, these being characters in mumming of the present day; and he also observes that the mummers of England and the guisards of Scotland present a shadow of the old mysteries which were the origin of the English drama. The practice of mumming is still continued at Christmas in many parts of England, when the characters, attired in grotesque dresses, enter the houses in the evening, suddenly throwing open the door, and one after the other enacting the different parts allotted to them as follows:—

[*Enter old Father Christmas, with a long beard.*]

Oh! here come I, old Father Christmas; welcome or welcome not,
I hope old Father Christmas will never be forgot.
Make room, room, I say,
That I may lead Mince Pye this way.
Walk in, Mince Pye, and act thy part,
And shew the gentles thy valiant heart.

[*Enter Mince Pye, with a wooden sword.*]

Room, room, you gallant souls, give me room to rhyme,
I will show you some festivity this Christmas time.
Bring me the man that bids me stand,
Who says he'll cut me down with audacious hand;
I will cut him and hew him as small as a fly,
And send him to Satan to make Mince Pye.
Walk in, St. George.

Oh! in come I St. George, the man of courage bold,
With my sword and buckler I have won three crowns of gold;
I fought the fiery Dragon, and brought him to the slaughter,
I won a beauteous Queen and a King of Britain's daughter.
If thy mind is high, my mind is bold;
If thy blood is hot, I will make it cold. (*They fight.*)
(*Mince Pye is vanquished and falls.*)

Mince Pye.—Oh! St. George, spare my life.
Christmas.—Is no Doctor to be found,
To cure this man who is bleeding on the ground?
[*Enter the Doctor.*]

Oh! yes, there is a Doctor to be found
To cure Mince Pye who is bleeding on the ground.
I cure the sick of every pain,
And raise the dead to life again.
Christmas.—Doctor, what is thy fee?
Doctor.—Ten pounds is my fee;
But fifteen I must take of thee,
Before I set this Gallant free.
Christmas.—Work thy will, Doctor.
Doctor.—I have a little bottle by my side.
The fame of which spreads far and wide;
Drop a drop on this poor man's nose.
(*Up jumps Mince Pye.*)

[*Enter Little Jack, a Dwarf, with dolls at his back.*]

Oh! in come I, little saucy Jack,
With all my family at my back;
Christmas comes but once a year,
And when it does it brings good cheer.
Roast beef, plum pudding, and Mince Pye.
Who likes that any better than I?
Christmas ale makes us dance and sing;
Money in purse is a very fine thing.
Ladies and Gentlemen, give us what you please.

SKETCHES OF THE PENINSULA.—No. XIV.

Barcelona.

A general account of the city of Barcelona has been given in No. 259 of the 'Penny Magazine,' as well as a sketch of part of the city. By now going somewhat more into detail, we shall furnish a pretty correct idea of its principal features.

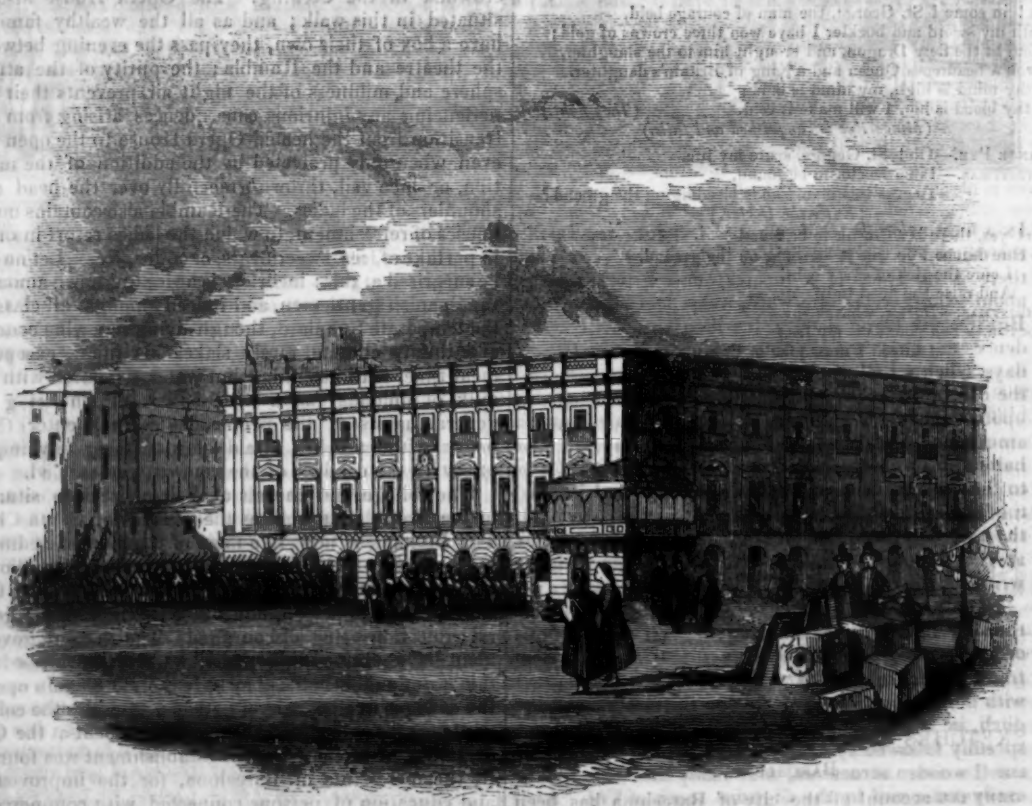
Barcelona is a regularly fortified city with a citadel and detached fort, and, next to Elvas, is perhaps one of the strongest fortifications in the Peninsula. The citadel, which is situated on the side next the plain, is a perfect model of its kind. It consists of a fortified heptagon, with ravelins and cavaliers, the bastions have retired orillon flanks; the tower which stands near the ramparts is singularly beautiful, and forms a cross, with an open lantern on the top. This tower, combined with the domes of the governor's house and the barracks in the square, gives a graceful and pleasing appearance to an object, at the best of an uninteresting character except to a scientific observer. The Esplanade, in front of the citadel and within the city walls, forms a pleasant walk during the delightful summer evenings. It is traversed by a quadruple row of stately elms, whose thick foliage forms a grateful protection from the heat of the sun, which in the summer is excessive. The centre is ornamented by grottos and by fountains, whose refreshing showers tend still further to cool the air, and though the sculptures do not exhibit the perfections of classic art, they are sufficiently well executed to be agreeable and pleasing ornaments to the walk. The public garden is situated at one end of the Esplanade; it is neither extensive nor beautiful, but contains a large collection of small singing birds. As all executions take place in the Esplanade, it is not much frequented by the inhabitants, and the Rambla, though neither possessed of fountains nor so many trees, is preferred by them. This promenade is situated in the heart of the city, and divides it into two unequal parts. The market is held at one end, while the other is reserved for the display of fashion and beauty. The excessive heat in the summer prevents the indulgence of the exercise of walking in the day time, but the Rambla is crowded in the evening. The Opera House also is situated in this walk; and as all the wealthy families have a box of their own, they pass the evening between the theatre and the Rambla; the purity of the atmosphere and mildness of the night air prevents their experiencing any injurious consequences arising from the transition from the heated Opera House to the open air, even when only protected by the addition of the mantilla, or lace veil, thrown gracefully over the head and shoulders of the ladies. The Rambla also contains many houses of refreshment, to which the ladies resort in order to partake of ices, sweetmeats, or coffee, &c. Let no one be surprised at this: inebriety is a vice unknown amongst the Spanish gentlemen, and indeed amongst all classes; the temperate Spaniard, though living in a wine country and thirsty climate, rarely slakes his thirst, except at meal time, with any thing but water, flavoured with the milk of almonds and a little sugar. Such being the general habits of the people, ladies may enter these places without being afraid of witnessing any impropriety in the conduct of the company assembled.

The college and church of Belem are also situated in the Rambla, as well as the convent of Santa Clara. This building is now, like most of the monastic edifices, converted into a barrack and is occupied by a battalion of the National Guard. The college was for a long time closed except to persons educating for the church; general education being discouraged. The present government have more enlightened views, and consider education a national benefit; they have therefore again opened the colleges to all classes of persons. Besides the college of Belem there is a mercantile establishment at the Casa de Lonja, or Exchange; this establishment was founded by the merchants of Barcelona, for the improvement and education of persons connected with commerce or the arts. The School of Design, chiefly for mercantile purposes, is well calculated to improve trade by introducing taste and elegance into every branch, while, by cultivating native talent, a premium is offered for im-

provement. The School of Design is lighted by gas, the only establishment which has attained to that improved method of lighting, the theatres and all other public places being illuminated with wax candles or oil, as in Britain some years back.

The building of the Casa de Lonja is extremely handsome, and is a fine specimen of the Doric order; the staircase is truly magnificent; each step being composed of one large slab of marble, and each landing-place of only two. The upper part of the building is entirely devoted to education; and class-rooms are established for the study of design, the classics, the English, French, Italian, and German languages, writing and mathematics; in short, every branch of a liberal education. The Casa de Lonja stands in the great square, or Plaza del Palaçio. The entrance to Barcelona by this square is exceedingly fine: the Custom-house, built entirely of white marble, and covered with ornament; the Ducal Palace, the beautiful palaces of the nobility, the Exchange, and the varied style of domestic architecture, with the fine towers of the old church of Our Lady of the Sea, are all objects of admiration to a stranger. The palace represented in our view is less interesting as a work of art than for its historical associations. It was from the windows in the corner that Philip V. acknowledged the rights and privileges of the Catalans after he had gained possession of the smoking ruins of their capital; it was here that Ferdinand halted on his way to Bayonne; it was here that the constitution was proclaimed in 1812; it was here that Colonel Bassa met his fate; and it was here that General Mina, the great Guerrilla chief, witnessed the proclamation of the constitution in 1836, and here also that he breathed his last. The circumstance of Mina's having lived and died in this palace, is sufficient to give interest to the spot, for though his character as a man may be charged with cruelty and severity, it cannot be denied that the peculiar organisation of the Guerrilla bands, their persevering courage and devoted patriotism, may be traced to his effective and incessant exertions.

The fortifications of Barcelona on this side are incomplete, but workmen are now actively employed in their erection. It is purposed to form an entrance into the square by two splendid gates, whose majestic appearance will considerably heighten the effect. The quays which run around the entire harbour are magnificent, and the mole on which the lighthouses are erected is a work of Herculean magnitude; indeed, the entire effect of the entrance to Barcelona from the sea is strikingly beautiful; the castle-crowned Monjuic, the harbour, the city, and the surrounding country, are of the most pleasing character. The position of Barcelona is extremely fine; it lies at the foot of a steep and strongly-fortified hill, on the shores of a small bay of the Mediterranean, and surrounded at a little distance by a semicircle of beautiful and picturesque hills which close it in on every side. The country around is crowded by the quintas, or country-houses, of the gentry, and covered with their gardens and orchards; numbers of fine convents enliven, with their white walls and belfries, the slopes of the hills, and some of the highest peaks are crowned by religious edifices of various dimensions, and for various purposes. Convents, monasteries, nunneries, and hermitages are scattered over the face of the country in every direction, and in the most conspicuous situations; some overhanging vast precipices—others crowning almost inaccessible mountains—others almost buried in the valleys—yet all uniting to excite the surprise or admiration of the traveller.



[Palace of Barcelona.]

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.
LONDON:—CHARLES KNIGHT & CO., 22, LUDGATE STREET.
Printed by William Clowes and Sons, Stamford Street.